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(54) **Slot sorting arrangement**

Einwurfs-Sortiervorrichtung

Arrangement pour trieur à fente

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(73) Proprietor: **THE POST OFFICE**
London EC1V 9HQ (GB)

(72) Inventors:
• **Langford, Jo**
DIDCOT, Oxfordshire OX11 9LS (GB)
• **Hodges, Kevin Neville**
LEICESTER LE2 1LR (GB)

• **Drake, Christopher James Thomas**
LEICESTER LE2 1WS (GB)
• **Dillon, Jane**
BURFORD, Oxfordshire OX18 4AA (GB)

(74) Representative:
Silverman, Warren et al
Haseltine Lake & Co.
Imperial House,
15-19 Kingsway
London WC2B 6UD (GB)

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Description

[0001] The present invention relates to slot sorting for example in the postal industry for the temporary storage of letters and/or packages undergoing sorting.

[0002] Sorting frames conventionally used in letter sorting comprise a rectangular array of open fronted boxes with each box being labelled in some way to show the intended destination of the letters or other postal items sorted to that box. On the assumption that each destination box is to receive a similar number of items, the construction of the array is relatively simple and straightforward in that each box is identical. However, it is usually the case that the number of items per box is not similar and, accordingly, a number of methods has been adopted to allow for such variations. For example, where an abnormally large number of items is to be routed to one destination, the destination is allotted two or more boxes, and for abnormally small numbers of items, two or more destinations are allotted a single box which may then require further sorting to separate each destination. Alternatively, for a small number of items, vertical dividers may be introduced into particular boxes such that each destination box has space generally for a maximum of two destinations, thus allowing items being sorted to be placed in the array in an appropriate box in a delivery sequence without the need for further sorting.

[0003] It has been found that the above-mentioned array of boxes is not always ergonomically the most efficient for the average or shorter than average height person as certain boxes are difficult to reach, especially from a restricted standing or sitting position. Accordingly, improvements to such known arrays have been made whereby the outermost columns of boxes are set at an angle to columns of boxes facing the person performing the sorting function in order to assist sorting. Indeed, columns of boxes intermediate the outermost columns and the columns immediately facing the sorter may have their dividing walls set at decreasing angles to enable the person sorting to have easier access to an increased number of boxes. The sorter is thus positioned facing a bay with columns of boxes located in an approximate curve.

[0004] It has also been found that, even with the above improvements, the labels for each box are often difficult to see owing to reflective glare and similarly the peripheral boxes of the array are often difficult to distinguish from adjacent boxes owing to distractions, caused by activities beyond the ends of the array or the glare of lights.

[0005] The known sorting frame arrangements are, however, invariably fixed in configuration, thereby still restricting the potential flexibility of known methods of sorting and/or storing items for the aforesaid reasons. In particular, in some sorting arrangements there is invariably a large number of redundant dividing walls defining too many boxes when only a few destinations are to be

sorted and, likewise, a number of individual boxes containing no items at all.

[0006] To be distinguished from such box-based sorting frames are slot sorting frames which contain a relatively large number of pigeon holes the spaces between which may be variable in width. An example of such a frame is disclosed in GB-A-1355467. Such frames enable items of mail to be stood on edge thereby simplifying the introduction of items of mail and easing their removal. In this document, the bottoms of the pigeon holes are formed by a number of fixed guide rods and adjacent partitions are connected to one another by chains, threads or like flexible means. These may be for example ball-chains pressed through slits into apertures adjacent the edge of the partitions. This is nevertheless a relatively cumbersome arrangement subject to breakage of the flexible means and failure of a whole row of pigeon holes.

[0007] US-A-3 905 484 discloses a modular, open-fronted, rectilinear box unit, for mounting in cantilevered manner in side-by-side arrangement in a row with like box units to form a slot sorting arrangement, comprising:

a back wall, a base and side walls; and
at least one planar dividing member, removably mountable in the box unit to divide vertically the interior thereof at one of a plurality of positions along the length thereof,
the back wall having a plurality of dividing member receiving sections, and the base having a plurality of dividing member receiving sections, respective receiving sections of the back wall and the base being in alignment with one another, the dividing member receiving sections of the back wall being for receiving one outer edge of a dividing member, and the dividing member receiving sections of the base being for receiving an other outer edge of a dividing member,
whereby a side wall and an adjacent dividing member or a pair of adjacent dividing members between them define slots for receipt of items to be supported on the base of the box unit.

[0008] In accordance with a first aspect of the invention, the box unit is **characterised in that** the side walls are front-sloping from the back wall to the front and the dividing member is L-shaped to permit easy sorting and removal of items by hand.

[0009] Preferably, the or each dividing member is profiled with deep front base and back wall portions and a shallow back wall base portion. The outer edge of the or each dividing member which is receivable in the back wall dividing member receiving sections may incline forward in an upper region thereof.

[0010] The box unit in accordance with the first aspect of the present invention may be provided as a kit of substantially flat parts. This enables it to be assembled at

the point of use. Each kit member may be formed of injection-moulded plastics material, preferably polypropylene, and enter into force fitting engagement.

[0011] In accordance with a second aspect of the invention, there is provided a slot sorting arrangement comprising a plurality of box units in accordance with the first aspect of the invention mounted in cantilevered manner in side-by-side arrangement in a row.

[0012] Preferably, the box units are mounted on a frame, and may be mounted such that slot sorting arrangements are arranged in a back to back arrangement with inadvertent transfer of items to be sorted through from one slot sorting arrangement to that behind it being prevented by the back walls of the box units. It is indeed also possible for the box units to be attached to a wall by, for example, fixing means such as a screw fitting.

[0013] Preferably, a plurality of rows of box units is mounted on a frame in a vertical array.

[0014] If desired, individual box units may be connected together, but generally this is not necessary.

[0015] In accordance with a third aspect of the invention, there is provided a slot sorting bay comprising:

a plurality of slot sorting arrangements in accordance with the second aspect of the invention, arranged in rows one above another to constitute a main sorting arrangement; and

a supplementary slot sorting arrangement comprising a plurality of rows of at least one said box unit, each with at least one said dividing member, and located at one end of the main sorting arrangement such that the box units of the main sorting arrangement are at an angle to the or each box unit of the supplementary slot sorting arrangement, the rows of the supplementary slot sorting arrangement being in line with rows of the main sorting arrangement.

[0016] In one embodiment, a further supplementary slot sorting arrangement is positioned at one end or at both ends thereof, at an angle to the slot sorting arrangement thereadjacent.

[0017] The or each supplementary slot sorting arrangement may be mounted on a frame.

[0018] The slot sorting bay may further comprise further slot sorting arrangements and/or supplementary slot sorting arrangements arranged in a back to back arrangement with respective slot sorting arrangements and/or supplementary slot sorting arrangements, back wall sections of opposed box units being of sufficient height to prevent inadvertent transfer of items to be sorted through from one box unit to that behind it.

[0019] A box unit of the supplementary slot sorting arrangement may, like the box units of the main sorting arrangement, be mounted on a frame, with adjacent frames being connected to one another. When the main sorting arrangement is wall mounted, then the supplementary slot sorting arrangement includes a frame which is attached to the wall.

[0020] A second supplementary slot sorting arrangement may be attached directly or through interposition of another type of slot sorting arrangement directly to a first supplementary slot sorting arrangement in one of a wide variety of sorting bay configurations embodying this aspect of the invention which may be conceived. Such a second supplementary slot sorting arrangement will participate in forming a curved array of sorting boxes.

[0021] It is proposed in accordance with this invention that the box units of supplementary slot sorting arrangements will be the same as the box units of the main slot sorting arrangement. When box units are set at an angle, flat bridging members may be interposed in such angle to provide resting areas for items whose destination is uncertain. These bridging members may enter into engagement with the box units through appropriate press fits. Although box units of all slot sorting arrangements embodying the invention will be subdividable, it is conceivable that at least one row of box arrangements, typically the top one, will not be provided with dividers and will be available for temporary location of items having a shape such that they cannot be introduced into the slots defined within the box units.

[0022] The box units themselves are, as aforesaid, subdivided by slots. By use of a sufficiently large number of dividers, it is possible even to provide pigeon holes for mail for single destinations, in particular, domestic destinations. Dividers may be colour coded, for example, to enable a delivery postman arranging his round to identify where breaks in his round occur to assist in bundling of sorted mail in a manner appropriate to the nature of the round.

[0023] Reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is an exploded front perspective view of box unit embodying the present invention in its first aspect;

Figures 2A and 2B are partial front perspective views of slot sorting arrangements of slot sorting arrangements embodying the present invention in both its second and third aspects, mounted respectively to a wall and frame and to two adjacent frames;

Figure 3 is a front perspective view of a sorting bay embodying the invention in its third aspect; and Figures 4A, 4B and 4C are schematic plan views of sorting bays embodying variations of both the second and third aspects of the present invention.

[0024] Figure 1 shows a box unit 9 with one representative movable divider 10 for use within the box unit. The box unit 9 is shown in an exploded view and comprises a label holder 18, a base 19, side walls 29 and a back wall 39. The label holder 18 preferably includes an anti-

reflective coating 17 or is tiltable. The box unit 9 is preferably provided as a kit of parts as shown, each part being manufactured from injection moulded polypropylene, which is assembled by means of conventional joining means, such as nuts and bolts, snap-fit connections or other interference or force fitting connections. Adhesive may be used for permanent joins if desired. With such a kit, the box unit 9 may be easily packaged for transport and assembled as required at point of use. As an alternative to providing separate members for the base, side walls and back wall of the box unit 9 for snap-fit connection, for example, it may be desirable to provide an already assembled box unit 9. This unit may be in the form of metal sheeting bent into the appropriate shape, for example, or an injection moulded plastics material suitably moulded to give an equivalent structure.

[0025] The box unit 9 is generally in the form of an open fronted deep rectangular tray, with a front opening 30 and with its side walls 29 having their top edge sloping from its back wall 39 to its front 30. The box unit 9 is capable of side by side arrangement with further box units in a row, the outside of the side walls 29 being preferably flat to allow for easy replacement, if required, of intermediate units 9 when so arranged. The units are adapted for cantilevered mounting, for example to a wall or to a frame, with the back of the unit 9 preferably including provision for conventional attachment means. This preferably comprises holes 38 in the back wall 39 to receive hooks, bolts or similar 138 which are mounted in a supporting wall or an upright frame member. Alternatively, the back wall may include shaped projections, for example hooks (not shown), to engage supporting means on a wall or frame. The cantilevered mounting of the box units allows vertical arrays to be constructed. Such an array may comprise one or more boxes horizontally and several vertically.

[0026] To position one or more dividers 10 in the box unit 9, a combination of grooves and slots is provided in the box unit, with the dividers mating therewith to provide a secure yet variable positioning of the dividers between the side walls 29 of the unit 9. Preferably, slots 24 are moulded into the base 19 of the unit 9, near the open front 30 and extending parallel to the side walls 29 a small distance towards the back wall 39. The number, spacing and width of such slots vary according to the shape of the dividers and according to the minimum spacing required between the dividers 10. The back inside wall of the unit 9 preferably also includes corresponding slots 26 extending within moulded grooves 25 whose number, spacing and width correspond to those of the slots 24 in the front of the unit 9. The slots 26 and grooves 25 extend vertically from the top of the back wall 39 to the base 19 of the unit 9. It may be preferable to provide further or similar grooves and slots (not shown), for example, additional grooves extending between the slots 24 and the grooves 25, to lessen the likelihood of inserting dividers in a twisted orientation.

[0027] The dividers 10 (only one shown in Figure 1) each comprise substantially planar mouldings, preferably manufactured from pressed steel or injection moulded polypropylene, in the shape of an L. Such a divider 10 has a front base projection 31 extending from a front base portion 101, a blank back wall base portion 102 and a back wall projection 33 extending from a back wall portion 103 which are adapted to fit into the slots 24, 26 in the box unit 9. These projections 31, 33 may be short in comparison with the depth or height of the box as shown or, if preferred, may be comparatively long or provided as two or more short projections. The projections may include a barbed connection 32 as shown for the projection 31. If such a connection 32 is employed in the dividers 10, it may be desirable to provide a horizontal or inclined traverse slot 34 from the front edge of the dividers 10 extending over the projection 31 towards the back wall to allow the barbed connection to be manipulated. To ease manipulation of the dividers 10 into and out of engagement with the box units 9, the top back wall edge of the dividers is inclined forwards as shown. This enables the front base projection 31 to engage the slot 24 after the back wall projection 33 is tilted backwards into engagement with the slot 26.

[0028] To enable users of the apparatus to distinguish between adjacent divided regions in a unit, the dividers 10 must be clearly visible. It may be desirable in this respect to colour the dividers differently and/or to extend the front edges of the dividers to slightly over the front edge 30 of the unit 9 so they are less likely to be lost from view amongst the postal products lying therebetween. In addition, the L-shaped dividers are profiled with deep front base and back wall portions 101, 103 and a shallow back wall base portion 102 to permit easy sorting and removal of items by hand, even where the dividers are relatively close together.

[0029] Referring to Figure 2A a slot sorting arrangement is mounted to a wall 1, with an adjacent supplementary frame 111 supporting a supplementary slot sorting arrangement 99 to produce one level of a sorting bay embodying the present invention in its third aspect.

[0030] Figure 2B shows a slot sorting arrangement (partially sectioned to show otherwise hidden detail) similar to that of Figure 2A but utilising frame 11 instead of the wall 1 as back support, as well as frame 11 at an angle thereto.

[0031] In each case, the frames 11, 111 are constructed from a rigid material such as steel or aluminium, usually rectangular and hollow in section, and which includes parallel upright members 2 and respective supporting feet members 4 and 5. The upright and supporting feet members are joined in any convenient manner, for example, by a welded joint and the supporting feet are provided with level adjusting means 5. The upright members 2 are spaced horizontally from one another by the approximate width of or a multiple of the box units 9 (by the approximate width of the box units

99) employed therewith and joined to each other approximately at waist level, for example, and at the top of the members 2 by horizontal members 6, 8, respectively. The box units preferably all mount to these upright members 2, although the horizontal members 6, 8 may be used instead for all or for some intermediate box units 9, 99. In Figure 2A, the adjacent supplementary frame 111 is preferably also mounted to the wall 1 by appropriate bracket means 112 as shown to support the frame 111 in addition to the supporting feet members 4, 5. In Figure 2B, the two frames 11, 111 are rigidly connected to one another by a bracket member 113 as shown to keep the frames 11, 111 from moving apart or, if the feet are insufficient to support each frame independently, to ensure the two frames 11, 111 form a self-supporting structure. It is readily apparent that the angle α between the frames 11, 111 determines the shape and configuration of the bracket members 112, 113. The brackets shown at 112, 113 are simply straight members with angled end portions. The upright members may be adapted to receive such bracket members 112, 113 at any angle and may even provide hinge means for adjustable angles. Depending on the desired angle α , it may be advantageous to provide further sorting space between each box member by providing a triangular base 20 as shown to fit between the box units 9, 99 at the end of each adjacent row in the corner of the frame. Additionally, a back wall 40 as shown may be provided. Conveniently, the back wall 40 and the base 20 may form part of or supplement the action of the bracket members 112, 113 for added rigidity between the frames 11, 111 or between the wall 1 and the frame 111, with attachment means being provided where necessary.

[0032] Figure 3 is a front perspective view of a sorting bay which comprises a main sorting arrangement of box units 9 and two successive supplementary sorting arrangement of arrays of box units 99 mounted to frames 11, 111 of Figure 2A or 2B. Each arrangement is mounted at a differing angle to an adjacent arrangement and includes respective contiguous horizontal working surfaces 66 at waist level. The top box units 9, 99 of each arrangement do not include any dividers 10, whilst the four lower levels of box units 9, 99 are provided with dividers 10 as desired. The working surfaces 66 are provided with their own upright members 26 and feet members 46, 56 as required which may be secured either to the frame members 2 of the frames 11, 111 as shown or to the wall 1. Conveniently, the slight gap between the working surfaces 66 and the immediately thereabove first box units 9, 99 is blocked by an appropriately sized sealing lip member 96 to ensure postal items are not inadvertently lost therebetween.

[0033] A containment device 7 in the form of a shallow box, for example, is recessed in any one of the working surfaces 66, with a flush mounted lid therefor. The choice of location is of course, arbitrary. Such a containment device 7 may be configured to hold stationery or

stray postal items. In addition, a secure locker 77 is provided attached to the frame, being positioned underneath the working surface 66.

[0034] If a sorting bay is not located against a wall or a blank surface, it may be advantageous to secure screens 100 to its rear to overcome problems of view-ward glare or distraction. The screens may be any shape or colour which are not distracting to the user of the sorting bay.

[0035] Figure 4A shows an array of box units 9 forming a sorting arrangement mounted to main frame 11, with supplementary arrays of box units 99 forming supplementary sorting arrangements mounted to supplementary frames 111 at each end thereof. This results in a double winged sorting bay.

[0036] Figure 4B shows a modified arrangement of Figure 4A in which an array of box units 9 is mounted on each side of the main frame 11 in back to back relation and supplementary arrays of box units 99 are mounted to two pairs of supplementary frames 111 provided at the respective ends of each main frame. In addition, a supplementary array of box units 99 is provided in back to back relation on one supplementary frame 111 with an array of box units 99. This forms two double winged sorting bays facing one another and a small separate bay.

[0037] Figure 4C shows an alternative arrangement in which an array of box units 9 is mounted to a main frame 11 and supplementary arrays of box units 99 are mounted to one pair of supplementary frames 111 provided at one end thereof. A further array of box units 99 is mounted in back to back relation with the supplementary arrays of box units 99 on these supplementary frames 111. This arrangement provides three separate sorting bays.

[0038] As shown in Figures 4A, 4B and 4C, horizontal working surfaces 66 are provided only at selected locations, rather than for each separate sorting bay. Also, it is apparent that sorting bays may be made up from one or more arrays of box units 9, 99.

Claims

1. A modular, open-fronted, rectilinear box unit (9,99), for mounting in cantilevered manner in side-by-side arrangement in a row with like box units to form a slot sorting arrangement, comprising:

a back wall (39), a base (19) and side walls (29); and

at least one planar dividing member (10), removably mountable in the box unit (9,9) to divide vertically the interior thereof at one of a plurality of positions along the length thereof, the back wall (39) having a plurality of dividing member receiving sections (25,26), and the base (19) having a plurality of dividing member receiving sections (24), respective receiving

sections of the back wall and the base being in alignment with one another, the dividing member receiving sections (25,26) of the back wall (39) being for receiving one outer edge of a dividing member (10), and the dividing member receiving sections (24) of the base (19) being for receiving an other outer edge of a dividing member (10),

whereby a side wall (29) and an adjacent dividing member (10) or a pair of adjacent dividing members (10) between them define slots for receipt of items to be supported on the base (19) of the box unit (9,99),

characterised in that the side walls (29) are front-sloping from the back wall (39) to the front and the dividing member (10) is L-shaped to permit easy sorting and removal of items by hand.

2. A box unit (9,99) as claimed in claim 1, wherein the or each dividing member (10) is profiled with deep front base (101) and back wall portions (103) and a shallow back wall base portion (102).

3. A box unit (9,99) as claimed in claim 1 or claim 2, wherein the outer edge of the or each dividing member (10) which is receivable in the back wall dividing member receiving sections (25,26) inclines forward in an upper region thereof.

4. A box unit (9,99) as claimed in any preceding claim, provided as a kit of substantially flat parts.

5. A slot sorting arrangement comprising a plurality of box units (9,99) as claimed in any preceding claim mounted in cantilevered manner in side-by-side arrangement in a row.

6. A slot sorting arrangement as claimed in claim 5, wherein the box units are mounted on a frame (11,111).

7. A slot sorting arrangement as claimed in claim 5, wherein the box units are mounted on a wall.

8. A slot sorting arrangement as claimed in claim 5, 6 or 7, which is one of a plurality of like slot sorting arrangements mounted in a vertical array.

9. A sorting bay comprising:

a plurality of slot sorting arrangements as claimed in claim 5, 6, 7 or 8, arranged in rows one above another to constitute a main sorting arrangement; and

a supplementary slot sorting arrangement comprising a plurality of rows of at least one said box unit (99), each with at least one said

dividing member (10), and located at one end of the main sorting arrangement such that the box units (9) of the main sorting arrangement are at an angle to the or each box unit (99) of the supplementary slot sorting arrangement, the rows of the supplementary slot sorting arrangement being in line with rows of the main sorting arrangement.

10. A sorting bay as claimed in claim 9, wherein a further supplementary slot sorting arrangement is positioned at one end or at both ends thereof, at an angle to the slot sorting arrangement thereadja-cent.

11. A sorting bay as claimed in claim 9 or claim 10, wherein the or each supplementary slot sorting arrangement is mounted on a frame (111).

12. A sorting bay as claimed in claim 9, 10 or 11, further comprising further slot sorting arrangements and/or supplementary slot sorting arrangements arranged in a back to back arrangement with respective slot sorting arrangements and/or supplementary slot sorting arrangements, back wall sections (39) of opposed box units being of sufficient height to prevent inadvertent transfer of items to be sorted through from one box unit to that behind it.

Patentansprüche

1. Modulare, frontseitig offene, geradlinige Kasteneinheit (9, 99) zum Zusammenbauen in freitragender Weise, nebeneinander in Reihe mit gleichen Kasteneinheiten, so dass eine Einwurfs-Sortiereinrichtung entsteht, umfassend:

eine Rückwand (39), eine Grundfläche (19) und Seitenwände (29); und

mindestens ein ebenes Trennteil (10), herausnehmbar in die Kasteneinheit (9, 99) einsetzbar, zur vertikalen Unterteilung dessen Innenraums an einer von zahlreichen Stellen entlang dessen Längsseite,

wobei die Rückwand (39) eine Anzahl Einsetzprofile (25, 26) für Trennteile hat und die Grundfläche (19) eine Anzahl Einsetzprofile (24) für Trennteile hat, die entsprechenden Einsetzprofile der Rückwand und der Grundfläche aufeinander ausgerichtet sind, die Trennteil-Einsetzprofile (25, 26) der Rückwand (39) zur Aufnahme einer Aussenkante eines Trennteils (10) und die Trennteil-Einsetzprofile (24) der Grundfläche (19) zur Aufnahme einer anderen Aussenkante des Trennteils (10) sind,

wobei eine Seitenwand (29) und ein angrenzendes Trennteil (10) oder ein Paar benachbarter Trennteile (10) zwischen sich Einwürlfe

bilden zur Aufnahme von Gegenständen, die auf der Grundfläche (19) der Kasteneinheit (9, 99) getragen werden, dadurch gekennzeichnet, dass

die Seitenwände (29) nach vorne abgeschrägt sind von der Rückwand (39) zur Vorderseite und das Trennteil (10) L-förmig ist, so dass einfaches Sortieren und Herausnehmen von Gegenständen per Hand ermöglicht wird.

2. Kasteneinheit (9, 99) nach Anspruch 1, wobei das oder alle Trennteile (10) im Profil einen breiten Vorderboden- (101) und Rückwandbereich (103) haben und einen schmalen Rückwand-Bodenbereich (102).
3. Kasteneinheit (9, 99) nach Anspruch 1 oder 2, wobei die Aussenkante des oder aller Trennteile (10), die in die Rückwand-Trennteil-Einsatzprofile (25, 26) passt, in seinem oberen Bereich nach vorne verdickt ist.
4. Kasteneinheit (9, 99) nach einem der vorstehenden Ansprüche, bereitgestellt als Bausatz aus im Wesentlichen flachen Teilen.
5. Einwurfsortieranordnung, umfassend eine Anzahl Kasteneinheiten (9, 99) nach einem der vorstehenden Ansprüche, zusammengebaut in freitragender Weise, nebeneinander in einer Reihe.
6. Einwurfsortieranordnung nach Anspruch 5, wobei die Kasteneinheiten auf einem Rahmen (11, 111) angebracht sind.
7. Einwurfsortieranordnung nach Anspruch 5, wobei die Kasteneinheiten an einer Wand angebracht sind.
8. Einwurfsortieranordnung nach Anspruch 5, 6 oder 7, die eine ist aus einer Anzahl gleicher Einwurfsortieranordnungen, die in vertikaler Anordnung angebracht sind.
9. Sortierfach, umfassend
 - eine Anzahl Einwurfsortieranordnungen nach Anspruch 5, 6, 7 oder 8, angeordnet in Reihen, eine über der anderen, so dass eine Hauptsortieranordnung entsteht; und
 - eine Zusatz-Einwurfsortieranordnung, umfassend eine Anzahl Reihen aus mindestens einer der Kasteneinheiten (99), jede mit mindestens einem der Trennteile (10), und angeordnet an einem Ende der Haupt-Sortieranordnung, so dass die Kasteneinheiten (9) der Hauptsortieranordnung schräg zu der oder allen Kasteneinheiten (99) der Zusatz-Einwurfsortier-

anordnung sind, wobei die Reihen der Zusatz-Einwurfsortieranordnung geradlinig sind mit den Reihen der Hauptsortieranordnung.

10. Sortierfach nach Anspruch 9, wobei eine weitere Zusatz-Einwurfsortieranordnung an einem oder beiden Enden davon angeordnet ist, schräg zur daneben liegenden Einwurf-Sortieranordnung.
11. Sortierfach nach Anspruch 9 oder 10, wobei die oder alle Zusatz-Einwurfsortieranordnung auf einem Rahmen (111) angebracht sind.
12. Sortierfach nach Anspruch 9, 10 oder 11, zudem umfassend weitere Einwurf -Sortieranordnungen und/oder Zusatz-Einwurfsortieranordnungen, rückseitiggegeneinander angeordnet zu entsprechenden Einwurfsortieranordnungen und/oder Zusatz-Einwurfsortieranordnungen, wobei die Rückwandbereiche (39) der gegenüberliegenden Kasteneinheiten ausreichend hoch sind, so dass ein ungewollter Austausch von Sortiergegenständen durch eine Kasteneinheit hindurch in die dahinter liegende verhindert wird.

Revendications

1. Boîte modulaire, ouverte à l'avant, rectiligne (9, 99), destinée à un montage en porte à faux dans un agencement côte à côte dans une rangée de boîtes similaires afin de former un agencement de classement par case, comprenant :

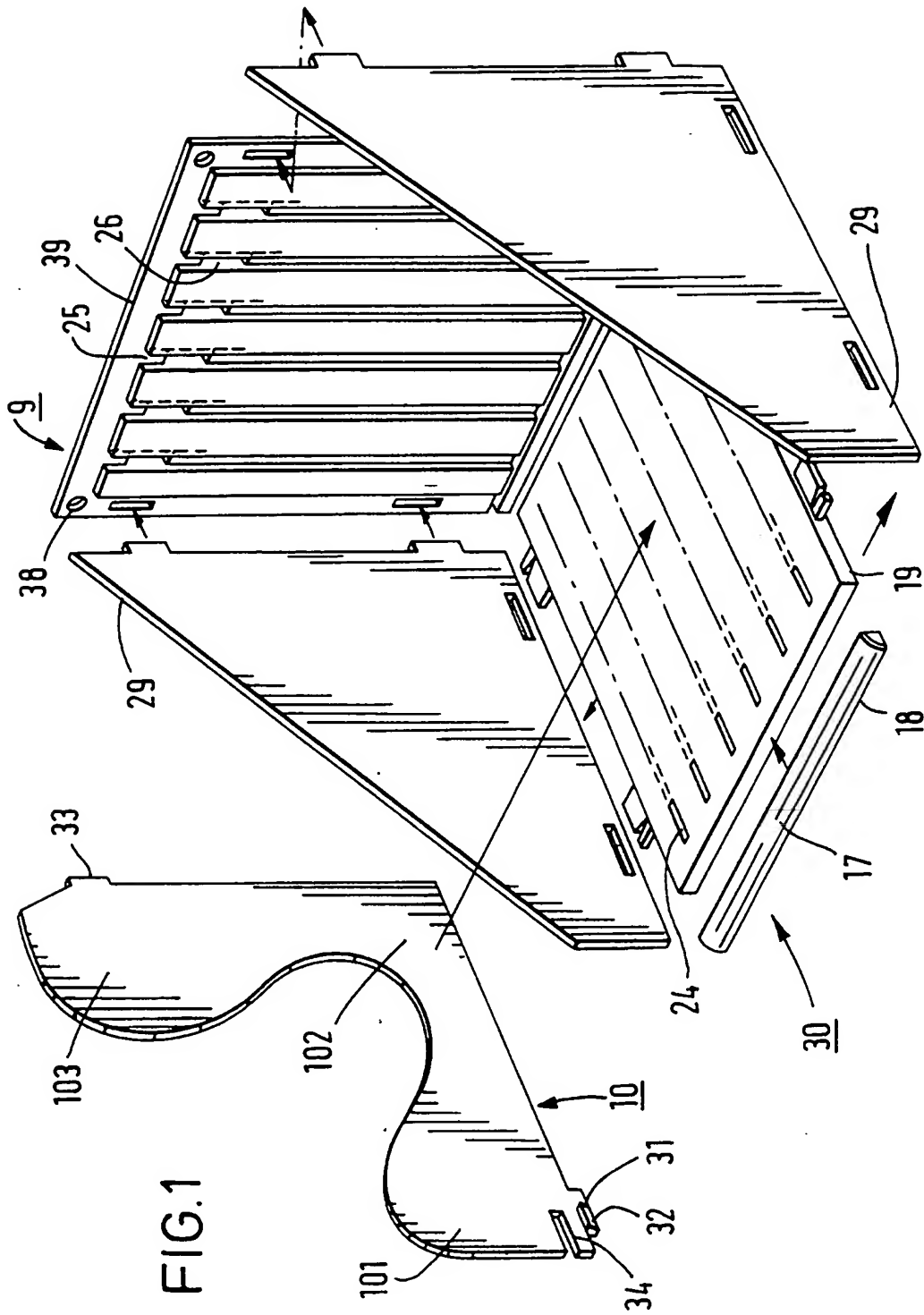
une paroi arrière (39), une embase (19) et des parois latérales (29); et
 au moins un élément séparateur plane (10), pouvant être monté de manière amovible dans la boîte (9, 99) afin de séparer verticalement l'intérieur de celle-ci sur une position d'une pluralité de positions sur l'ensemble de la longueur de celle-ci;
 la paroi arrière (39) comportant une pluralité de sections de réception d'éléments séparateurs (25, 26), et l'embase (19) comportant une pluralité de sections de réception d'éléments séparateurs (24), les sections de réception respectives de la paroi arrière et de l'embase étant en alignement les unes par rapport aux autres, les sections de réception d'élément séparateur (25, 26) de la paroi arrière (39) étant destinées à recevoir un bord extérieur d'un élément séparateur (10), et les sections de réception d'élément séparateur (24) de l'embase (19) étant destinées à recevoir un autre bord extérieur d'un élément séparateur (10),
 par lesquels une paroi latérale (29) et un élément séparateur adjacent (10) ou une paire d'éléments séparateurs adjacents (10) situés

entre eux définissent des cases destinées à recevoir des articles devant être supportés sur l'embase (19) de la boîte (9, 99); caractérisée en ce que les parois latérales (29) sont inclinées vers l'avant à partir de la paroi arrière (39) vers l'avant et en ce que l'élément séparateur (10) est en forme de L afin de permettre un classement et un enlèvement manuels aisés des articles.

2. Boîte (9, 99) selon la revendication 1, dans laquelle l'élément séparateur ou chacun des éléments séparateurs (10) a un profil comportant une embase avant profonde (101) et des parties de paroi arrière (103) et une partie d'embase de paroi arrière peu profonde (102).
3. Boîte (9, 99) selon la revendication 1 ou la revendication 2, dans laquelle le bord extérieur de l'élément séparateur ou de chaque élément séparateur (10) qui peut être reçu dans les sections de réception d'élément séparateur de paroi arrière (25, 26) est incliné vers l'avant dans une zone supérieure de celles-ci.
4. Boîte (9, 99) selon l'une quelconque des revendications précédentes, fournie en tant qu'ensemble de pièces essentiellement plates.
5. Agencement de classement par case comprenant une pluralité de boîtes (9, 99) selon l'une quelconque des revendications précédentes montées en porte à faux dans un agencement côte à côte dans une rangée.
6. Agencement de classement par case selon la revendication 5, dans lequel les boîtes sont montées sur un bâti (11, 111).
7. Agencement de classement par case selon la revendication 5, dans lequel les boîtes sont montées sur une paroi.
8. Agencement de classement par case selon les revendications 5, 6 ou 7, qui est un agencement d'une pluralité d'agencements de classement par case identiques montés en rangées verticales.
9. Travée de classement comprenant :
 - une pluralité de classements par case selon les revendications 5, 6, 7 ou 8, agencés en rangées les unes au-dessus des autres afin de constituer un agencement de classement principal; et
 - un agencement de classement par case complémentaire comprenant une pluralité d'au moins une dite boîte (99), chacune comportant

au moins un dit élément séparateur (10), et situé à une extrémité de l'agencement de classement principal de sorte que les boîtes (9) de l'agencement de classement principal sont disposées suivant un angle par rapport à la boîte ou à chacune des boîtes (99) de l'agencement de classement complémentaire, les rangées de l'agencement par cases complémentaires étant dans l'alignement des rangées de l'agencement de classement par case principal.

10. Travée de classement selon la revendication 9, dans laquelle un autre agencement par case complémentaire est positionné à une extrémité ou aux deux extrémités de celle-ci, suivant un certain angle par rapport à l'agencement de classement par case adjacent à celle-ci.
11. Travée de classement selon la revendication 9 ou la revendication 10, dans laquelle l'agencement de classement par case complémentaire ou chaque agencement de classement par case complémentaire est monté sur un bâti (111).
12. Travée de classement selon les revendications 9, 10, ou 11, comprenant en outre d'autres agencements de classement par case et / ou des agencements par case complémentaires disposés dans un agencement dos à dos avec des agencements de classement par case respectifs et / ou des agencements de classement par case complémentaires, les sections de paroi arrière (39) des boîtes opposées étant de hauteur suffisante pour empêcher un transfert effectué par mégarde d'articles devant être classés à partir d'une boîte vers celle qui se trouve derrière celle-ci.



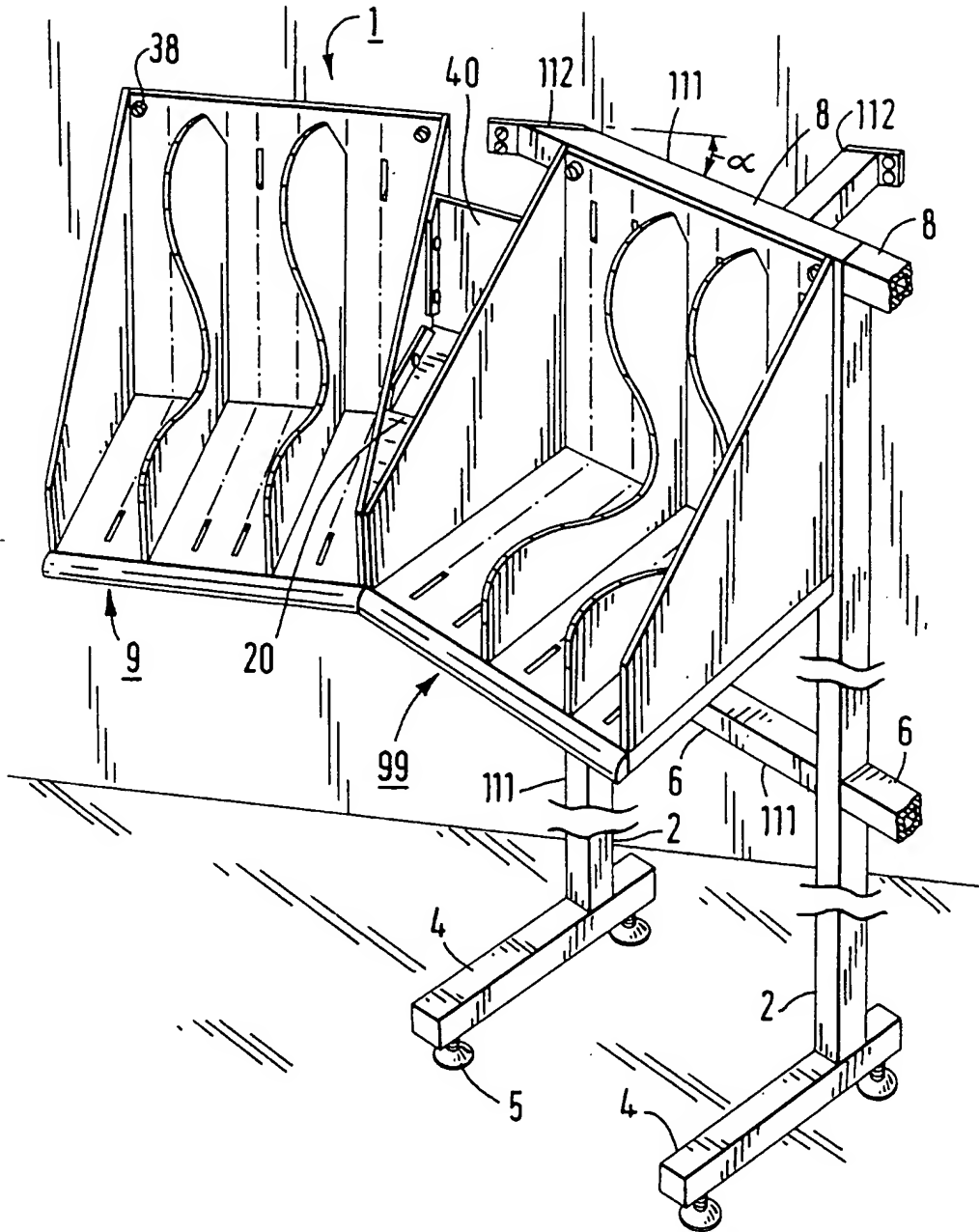
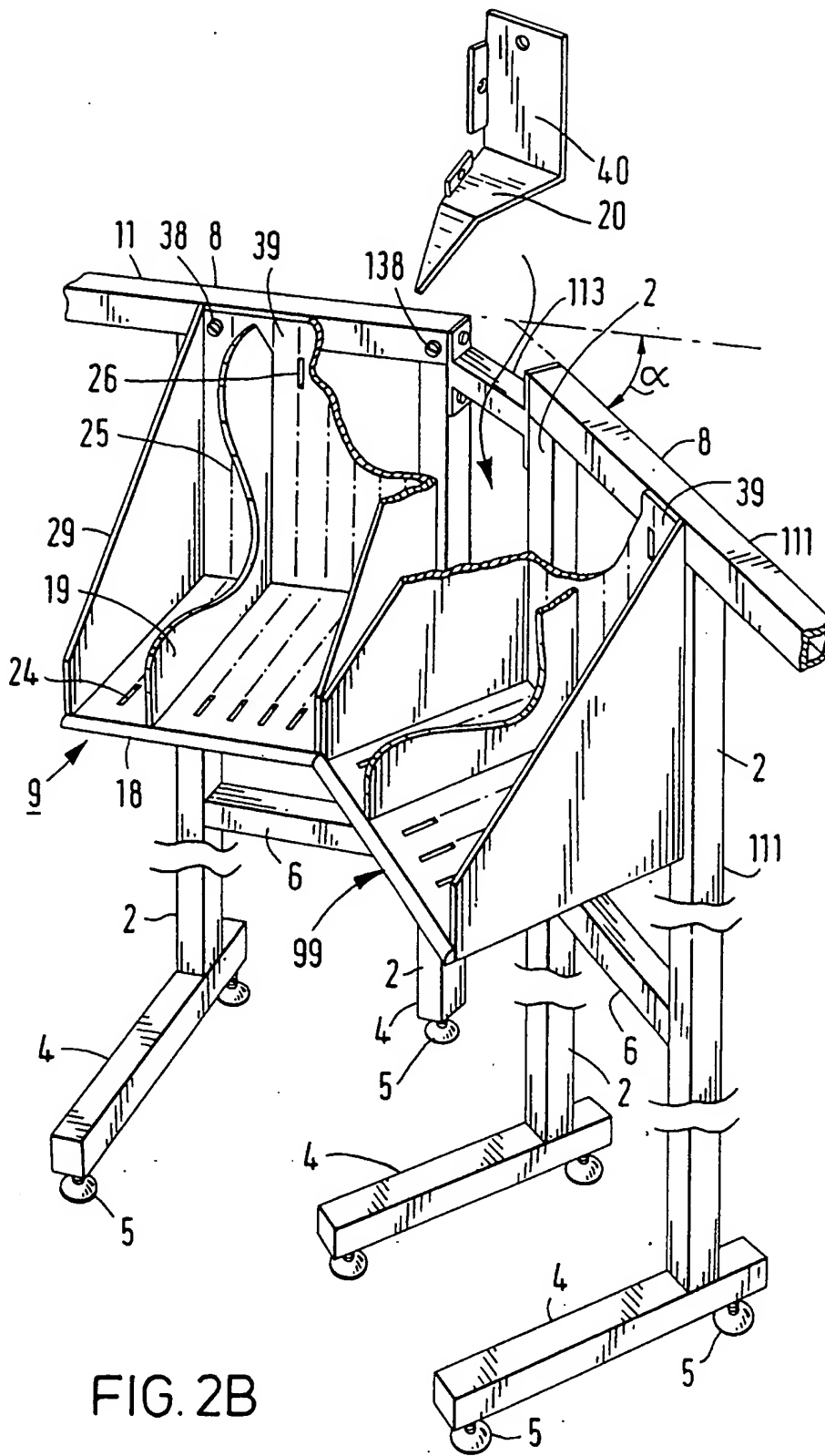


FIG. 2A



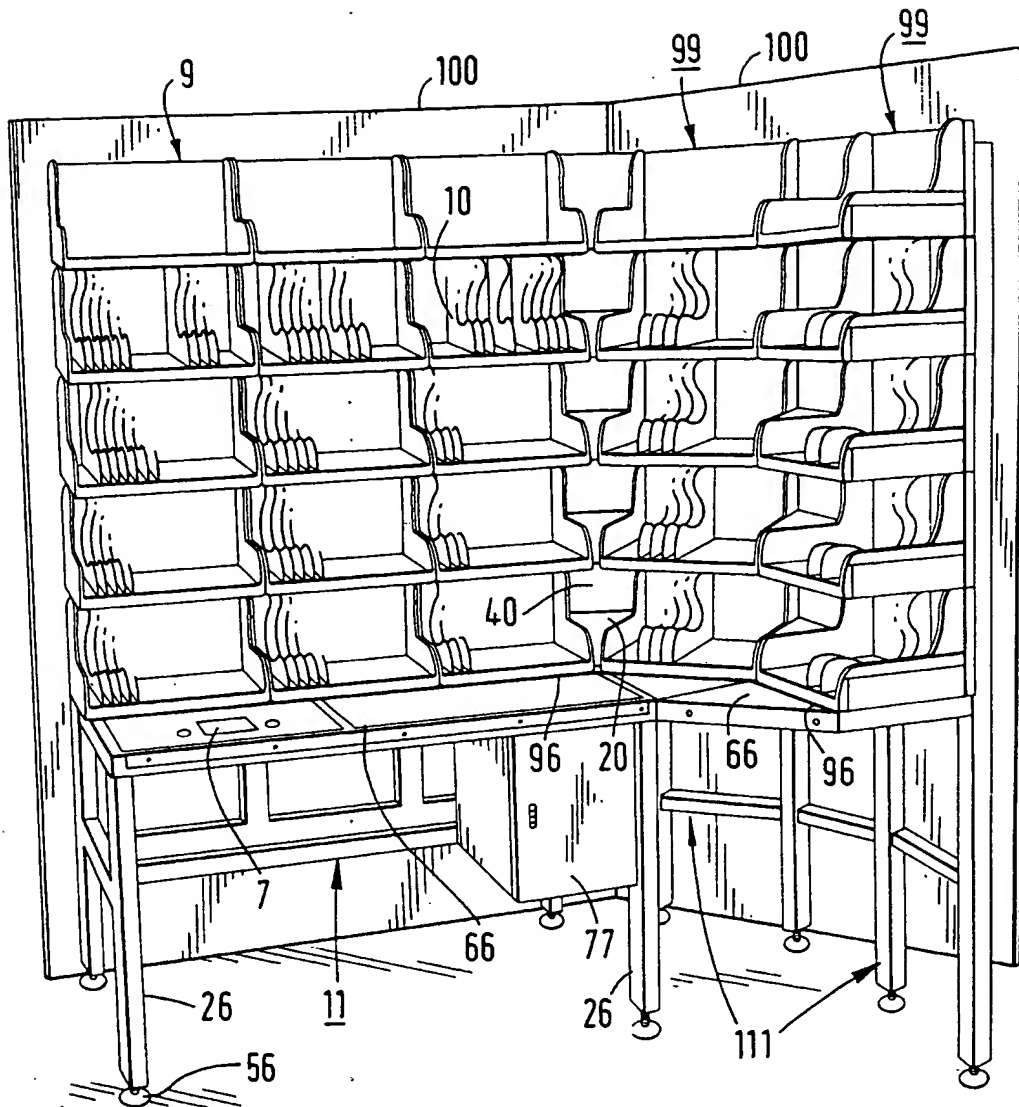


FIG.3

